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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/701,433
Filing Date: November 29, 2000
Appellant(s): KAJITA, KUNIYUKI

James E. Ledbetter
For Appellant

Revised's EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/11/06 appealing from the Office action mailed 4/20/05.The statement of the status of claims contained in the brief is correct.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

There are no related appeals or interferences.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

There are no related appeals or interferences.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

a) US Patent No. 6,199,186 by Chen et al.

b) IEEE, "Rate Matching in Multi-channel System using RCPC-Codes" by Frenger et al, 1997, pgs. 354-357.

c) Akihiko et al "Study on Wideband CDMA System in Burst Error Environment" Personal Wireless Communications, 1997, IEEE International Conference on Mumbai, India, Dec. 17-19, 1997 New York, NY, USA, IEEE, US, Dec. 17, 1997, XP010268141, ISBN: 0-7803-4298-4, pp. 324-328.

d) Applicant admitted prior art, Figures 1A, 1B and 2.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

a) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

b) Claims 11-13, 19, 21-25, 31, 33-34, 36, 38, 41 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (6,199,186) in view of Frenger et al ("Rate Matching in Multi-Channel Systems using RCPC-Codes" 1997, IEEE, pgs. 354-357) and further in view of Akihiko et al ("Study on Wideband CDMA System in

Burst Error Environment" personal Wireless Communications, 1997, IEEE International Conference on Mumbai, India Dec, 17-19, 1997, New York, NY, USA, IEEE, US, Dec. 17, 1997, XP010268141, ISBN: 0-7803-4298-4, PP. 324-328).

As per claims 11, 13, 21-22, 36 and 38, Chen et al disclose a transmission system, comprising:

A coder that performs error correction coding of input data including a plurality of bits (Fig. 1, col. 4, lines 6-17); and

An interleaving that performs interleaving of the bits coded by the coder (Fig. 1, col. 4, lines 18-19).

Chen et al do not disclose a rate matcher that comprises a repeater and a puncture, wherein the rate matcher alternatively selects between

i) employing the repeater to repeat a part of the bits interleaved by the interleaving, and

ii) employing the puncture to puncture a part of the bits interleaved by the interleaving. However, Frenger et al disclose a rate matcher that comprises a repeater and a puncture (col. 2, section II, RCPC-Codes for Rate Matching, pg. 354). Frenger et al neither disclose that the rate matching is performed before or after interleaving. However, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to set the rate matcher to either the rate matching followed by interleaving is performed after convolutional code after coding to reduce burst error or interleaving followed by rate matching is performed after convolutional coding to reduce burst error. Therefore, it would have been obvious to a person of ordinary skill in the

art, at the time the invention, to combine the rate matching of Frenger into the interleaving performed after coding of Chen to rate match for reducing burst error. Thus, the combination of Chen et al and Frenger et al would be performed the interleaving before the rate matcher.

In addition for the missing part of Chen et al and Frenger et al, Akihiko et al disclose a rate matcher that is performed after interleaving (See pp. 325, "Figure 1, Burst Error Reduction methods"). Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to incorporate a rate matcher that is performed after interleaving as taught by Akihiko et al into the invention of Chen et al and Frenger et al to rate match for reducing burst errors.

As per claim 12, Chen et al further disclose, wherein the coder performs the error correction coding of the input data to provide error correction coded data and the interleaving performs the interleaving of the error correction coded data (Fig. 1, col. 4, lines 6-19).

As per claim 19, this method claim is rejected under similar rationale as set forth in the system claim 11.

As per claims 23, 25, 33-34, 41 and 43, Chen et al disclose a transmission system, comprising:

A coder that performs error correction coding of input data including a plurality of bits (Fig. 1, col. 4, lines 6-17); and

An interleaving that performs interleaving of the bits coded by the coder (Fig. 1, col. 4, lines 18-19).

Chen et al do not disclose a rate matcher that repeats a part of bits interleaved by the interleaving. However, Frenger et al disclose a rate matcher includes a repeater (col. 2, section II, RCPC-Codes for Rate Matching, pg. 354). Frenger et al neither disclose that the rate matching is performed before or after interleaving.

However, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to set the rate matcher to either the rate matching followed by interleaving is performed after convolutional code after coding to reduce burst error or interleaving followed by rate matching is performed after convolutional coding to reduce burst error. Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention, to incorporate the rate matching of Frenger into the interleaving performed after coding of Chen to rate match for reducing burst error. Thus, the combination of Chen and Frenger would be performed the interleaving before the rate matcher.

In addition for the missing part of Chen et al and Frenger et al, Akihiko et al disclose a rate matcher that is performed after interleaving (See pp. 325, "Figure 1, Burst Error Reduction methods"). Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to incorporate a rate matcher that is performed after interleaving as taught by Akihiko et al into the invention of Chen et al and Frenger et al to rate match for reducing burst errors.

As per claim 24, this claim is also rejected under similar rationale as set forth in claim 12.

As per claim 31, this method claim is also rejected under similar rationale as set forth in claim 19.

c) Claims 20, 32, 35, 37, 39-40, 42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (6,199,186) in view of Frenger et al ("Rate Matching in Multi-Channel Systems using RCPC-Codes" 1997, IEEE, pgs. 354-357) and Akihiko et al ("Study on Wideband CDMA System in Burst Error Environment" personal Wireless Communications, 1997, IEEE International Conference on Mumbai, India Dec, 17-19, 1997, New York, NY, USA, IEEE, US, Dec. 17, 1997, XP010268141,
ISBN: 0-7803-4298-4, PP. 324-328) as applied to claims 11 and 19 above, and further in view of the applicant admitted prior art (Figs. 1A, 1B and 2).

As per claim 20, the teaching of Chen et al, Frenger et al and Akihiko et al had been discussed above. They do not disclose: in the reception side:

Employing a second rate matcher that comprises a second repeater and a second puncture to alternatively select between second repeater and second puncture; and

Performing de-interleaving of data including bits provided by the second rate matcher.

However, the admitted prior art, in the receiver side, teaches that a signal received by a reception antenna is subjected to predetermined radio processing and demodulation processing and so forth before inverse rearrangement against the interleaving is performed in the de-interleaving . In this rearranged data, the number of

bits which are increased or decreased in the transmitter side once are decreased or increased in the puncturing or repeating section. (See Figs. 1A, 1B and pgs 1-3),

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to incorporate the steps of employing a second rate matcher that comprises a second repeater and second puncturer to alternatively select between second repeater and second puncturer, and performing de-interleaving of data as taught by the AAPA into the invention of Chen et al, Frenger et al and Akihiko et al in order for adjusting coded data to frame length. The admitted prior art, in the receiver side, does not disclose that rate matcher follows by de-interleaving. However, since, in the transmitter side, the order of interleaving before or after rate matcher is obvious to a person of ordinary skilled in the art, at the time the invention was made, to reduce burst error. Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, in the receiver side, to reconstruct the interleaving data by de-interleaving it before or after a second rate matching by repetition or puncture, according to the order of the transmitter side, for adjusting the number of bits in the data block to reverse the action of the coding device.

As per claims 32, 35, 37, 39-40, 42 and 44, these claims are rejected under similar rationale as set forth in claim 20.

(10) Response to Argument

Applicant argues that:

Firstly, Applicant argues that Frenger discloses two different convolutional encoders with embedded rate matching meaning 1) both repetition and puncture;

2) repetition only or puncture only. Contrary to the position taken in the final rejection, Frenger does not disclose a single device employing both RCPC-codes (puncturing) and a fixed convolutional code concatenated wit a repetition code (repeating).

Examiner disagrees with application in that such fabrication unsupported by proof or a showing of facts. It doesn't make sense unless one of ordinary skill in the art at the time the invention was made was deliberately trying to waste space on a semiconductor or waste computer time introducing unnecessary circuitry or software.

In a convolutional coding system, a digital input is coded by a convolutional coding circuit. The convolutional coding circuit may be desirable to adjust the coding rate so that the requirements for the remainder of the communication circuitry including the communication channel. For example in order to increase the code rate it is possible to pass the convolutional output through a rate matcher (puncturing circuit) for removing selected bits from the convolutional output. Alternatively in order to reduce the code rate it is possible to pass the output through a rate matcher (repetition circuit) for repeating selected bits of the output.

Therefore, One of ordinary skill in the art at the time the invention was made would have known that Frenger uses only one convolutional encoder with embedded rate matcher that comprises a puncture and a repetition, wherein the

rate matcher alternatively selects between repetition and puncture. (See pg. 354, section II: RCPC-Codes for Rate Matching).

Secondly, Applicant argues that Frenger by implication adopts the order of coding, which includes rate matching, then interleaving as disclosed by Hagenauer which provides the fundamental concept of the RCPC coding discussed in Frenger article (submitted with the response filed July 19, 2005).

Examiner disagrees with applicant because applicant arguments is directed to Hagenauer which is not directed to the applied art.

Examiner also disagrees with applicant because nothing spectacular about placing interleave before or after since it serves a distinct purpose from rate matching is for burst error.

Frenger et al neither disclose that the rate matching is performed before or after interleaving.

However, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to set the rate matcher to either the rate matching followed by interleaving is performed after convolutional code after coding to reduce burst error or interleaving followed by rate matching is performed after convolutional coding to reduce burst error. Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention, to incorporate the rate matching of Frenger into the interleaving performed after coding of Chen to rate match for reducing burst error. Thus, the combination of Chen and Frenger would be performed the interleaving before the rate matcher.

In addition for the missing part of Chen et al and Frenger et al, Akihiko et al disclose a rate matcher that is performed after interleaving (See pp. 325, "Figure 1, Burst Error Reduction methods"). Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to incorporate a rate matcher that is performed after interleaving as taught by Akihiko et al into the invention of Chen et al and Frenger et al to rate match for reducing burst errors.

Thirdly, Applicant argues that the mention of a motivation to reduce burst error is unsupported by any reasoning or any citation of anything in any of the references that would have suggested such a motivation. The sole source for this motivation is found in the Appellant's own application. Thus, the alleged motivation is based on improper hindsight given that the motivation is not provided by the prior but rather by the Appellant's own invention.

Examiner disagrees with applicant in that the motivation is not based on improper hindsight but the motivation is in fact provided by the cited prior art, Akihiko et al "Study on Wideband CDMA System in Burst Error Environment", pg. 325, Figure 1, Burst Error Reduction methods:

a) encoder follows by rate matcher (repetition) then interleaving; or

b) encoder follows by interleaving then rate matcher (repetition); or

c) encoder follows by interleaving

to rate match for reducing burst errors.

Fourthly, Applicant argues that the applicant's admitted prior art (AAPA) merely discloses a coding device in which, first, the number of bits is increased, and then, the

bits are rearranged in an interleaving. This is opposite to the order of the claimed invention (interleaving then rate matching), and there is no reason for the rate matching, i.e., either before or after de-interleaving.

Examiner disagrees with applicant because since the admitted prior art teaches that in the receiver side, a signal received by a reception antenna is subjected to predetermined radio processing and demodulation processing and so forth before inverse rearrangement against the inferleaving is performed in the de-interleaving. In this rearranged data, the number of bits which are increased or decreased in the transmitter side once are decreased or increased in the puncturing or repeating section. (See Figs. 1A, 1B and pgs 1-3), and since, in the transmitter side, the order of interleaving before or after rate matcher is obvious to a person of ordinary skilled in the art, at the time the invention was made, to reduce burst error. Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, in the receiver side, to reconstruct the interleaving data by de-interleaving it before or after a second rate matching by repetition or puncture, according to the order of the transmitter side, for adjusting the number of bits in the data block to reverse the action of the coding device.

(11) Evidence Appendix

There is no evidence submitted pursuant to 37 CFR 1.130, 1.131 or 1.132 or any other evidence entered by the examiner and relied upon by the Appellants in this appeal.

(12) Related Proceeding(s) Appendix

There is no decision rendered by a court or the Board in any related proceeding identified pursuant to 37 CFR 41.67(c)(1)(ii).

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to

reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

PHUNG M. CHUNG
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

Primary Patent Examiner: Phung My Chung

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

Conferees:

ALBERT DECADY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

JAMES DWYER, DIRECTOR
TECHNOLOGY CENTER 2100

JOSEPH D. TORRES
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100